

1. (currently amended): ~~Use as a catalyst for~~ A method of catalyzing an oxidation-reactions reaction using molecular oxygen and/or air, which comprises contacting an oxidizable substrate with molecular oxygen and/or air in the presence of a catalytically effective amount of at least one metal complex compound of formula (1)



wherein

Me is manganese, titanium, iron, cobalt, nickel or copper,

X is a coordinating or bridging radical,

n and m are each independently of the other an integer having a value of from 1 to 8,

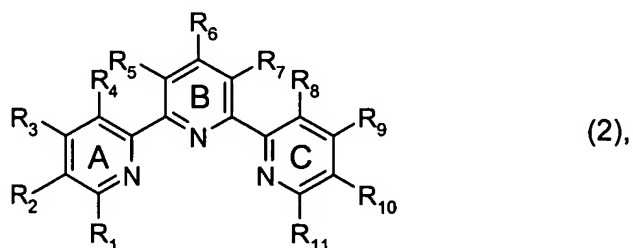
p is an integer having a value of from 0 to 32,

z is the charge of the metal complex,

Y is a counter-ion,

q = z/(charge of Y), and

L is a ligand of formula (2)



wherein

R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, R₁₀ and R₁₁ are each independently of the others hydrogen;

unsubstituted or substituted C₁-C₁₈alkyl or aryl; cyano; halogen; nitro; -COOR₁₂ or -SO₃R₁₂ wherein

R₁₂ is in each case hydrogen, a cation or unsubstituted or substituted C₁-C₁₈alkyl or aryl; -SR₁₃,

-SO₂R₁₃ or -OR₁₃ wherein R₁₃ is in each case hydrogen or unsubstituted or substituted C₁-C₁₈alkyl or

aryl; -NR₁₄R₁₅; -(C₁-C₆alkylene)-NR₁₄R₁₅; -N[⊕]R₁₄R₁₅R₁₆; -(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆;

-N(R₁₃)-(C₁-C₆alkylene)-NR₁₄R₁₅; -N[(C₁-C₆alkylene)-NR₁₄R₁₅]₂; -N(R₁₃)-(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆;

-N[(C₁-C₆alkylene)-N[⊕]R₁₄R₁₅R₁₆]₂; -N(R₁₃)-N-R₁₄R₁₅ or -N(R₁₃)-N[⊕]R₁₄R₁₅R₁₆ wherein R₁₃ is as defined above and R₁₄, R₁₅ and R₁₆ are each independently of the other(s) hydrogen or unsubstituted or

substituted C₁-C₁₈alkyl or aryl, or R₁₄ and R₁₅, together with the nitrogen atom linking them, form an unsubstituted or substituted 5-, 6- or 7-membered ring which may contain further hetero atoms.

2. (currently amended): ~~Use A method~~ according to claim 1, wherein Me is manganese, which is in oxidation state II, III, IV or V.

3. (currently amended): ~~Use A method~~ according to ~~either claim 1 or claim 2~~, wherein X is CH₃CN, H₂O, F⁻, Cl⁻, Br⁻, HOO⁻, O₂²⁻, O²⁻, R₁₇COO⁻, R₁₇O⁻, LMeO⁻ or LMeOO⁻, wherein R₁₇ is hydrogen or unsubstituted or substituted C₁-C₁₈alkyl or aryl, and L and Me are as defined in claim 1.

4. (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 3~~ claim 1, wherein Y is R₁₇COO⁻, ClO₄⁻, BF₄⁻, PF₆⁻, R₁₇SO₃⁻, R₁₇SO₄⁻, SO₄²⁻, NO₃⁻, F⁻, Cl⁻, Br⁻ or I⁻, wherein R₁₇ is hydrogen or unsubstituted or substituted C₁-C₁₈alkyl or aryl.

5. (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 4~~ claim 1, wherein n is an integer having a value of from 1 to 4, ~~especially 1 or 2~~.

6. (currently amended): (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 5~~ claim 1, wherein m is an integer having a value of 1 or 2, ~~especially 1~~.

7. (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 6~~ claim 1, wherein p is an integer having a value of from 0 to 4, ~~especially 2~~.

8. (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 7~~ claim 1, wherein z is an integer having a value of from 8- to 8+.

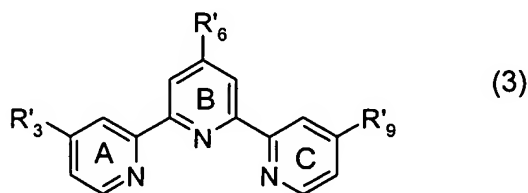
9. (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 8~~ claim 1, wherein aryl is phenyl or naphthyl each unsubstituted or substituted by C₁-C₄alkyl, C₁-C₄alkoxy, halogen, cyano, nitro, carboxy, sulfo, hydroxy, amino, N-mono- or N,N-di-C₁-C₄alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, phenyl, phenoxy or by naphthyloxy.

10. (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 9~~ claim 1, wherein

the 5-, 6- or 7- membered ring formed by R₁₄ and R₁₅ together with the nitrogen atom linking them is an unsubstituted or C₁-C₄alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring.

11. (currently amended): ~~Use A method~~ according to ~~any one of claims 1 to 10~~ claim 1, wherein R₆ is ~~preferably~~ C₁-C₁₂alkyl; phenyl unsubstituted or substituted by C₁-C₄alkyl, C₁-C₄alkoxy, halogen, cyano, nitro, carboxy, sulfo, hydroxy, amino, N-mono- or N,N-di-C₁-C₄alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, phenyl, phenoxy or by naphthyloxy; cyano; halogen; nitro; -COOR₁₂ or -SO₃R₁₂ wherein R₁₂ is in each case hydrogen, a cation, C₁-C₁₂alkyl, unsubstituted phenyl or phenyl substituted as indicated above; -SR₁₃, -SO₂R₁₃ or -OR₁₃ wherein R₁₃ is in each case hydrogen, C₁-C₁₂alkyl, unsubstituted phenyl or phenyl substituted as indicated above; -N(R₁₃)-NR₁₄R₁₅ wherein R₁₃ is as defined above and R₁₄ and R₁₅ are each independently of the other hydrogen, unsubstituted or hydroxy-substituted C₁-C₁₂alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R₁₄ and R₁₅, together with the nitrogen atom linking them, form an unsubstituted or C₁-C₄alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring; -NR₁₄R₁₅ or -N[®]R₁₄R₁₅R₁₆ wherein R₁₄, R₁₅ and R₁₆ are each independently of the other(s) hydrogen, unsubstituted or hydroxy-substituted C₁-C₁₂alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R₁₄ and R₁₅, together with the nitrogen atom linking them, form an unsubstituted or C₁-C₄alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring; and R₁, R₂, R₃, R₄, R₅, R₇, R₈, R₉, R₁₀ and R₁₁ are as defined above or are hydrogen.

12. (currently amended): ~~Use A method~~ according to claim 11, wherein the ligand L is a compound of formula (3)



wherein

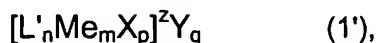
R'₃, R'₆ and R'₉ have the meanings given for R₆ in claim 11.

13. (currently amended): ~~Use A method~~ according to claim 12, wherein

R'₃, R'₆ and R'₉ are each independently of the others C₁-C₄alkoxy; hydroxy; phenyl unsubstituted or substituted by C₁-C₄alkyl, C₁-C₄alkoxy, phenyl or by hydroxy; hydrazine; amino; N-mono- or N,N-di-C₁-C₄alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety; or an ~~unsubstituted~~ unsubstituted or C₁-C₄alkyl-substituted pyrrolidine, piperidine, piperazine, morpholine or azepane ring.

14. (currently amended): ~~Use A method~~ according to claim 13, wherein R₆ is hydroxy.

15. (currently amended): ~~Use A method according to any one of claims 1 to 10~~ claim 1, wherein there is used at least one metal complex compound of formula (1')



wherein

Me is manganese, titanium, iron, cobalt, nickel or copper,

X is a coordinating or bridging radical,

n and m are each independently of the other an integer having a value of from 1 to 8,

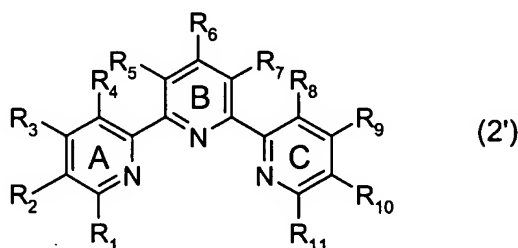
p is an integer having a value of from 0 to 32,

z is the charge of the metal complex,

Y is a counter-ion,

q = z/(charge of Y), and

L' is a ligand of formula (2')



wherein

R₁, R₂, R₃, R₄, R₅, R₆, R₇, R₈, R₉, R₁₀ and R₁₁ are each independently of the others hydrogen; unsubstituted or substituted C₁-C₁₈alkyl or aryl; cyano; halogen; nitro; -COOR₁₂ or -SO₃R₁₂ wherein R₁₂ is in each case hydrogen, a cation or unsubstituted or substituted C₁-C₁₈alkyl or aryl; -SR₁₃, -SO₂R₁₃ or -OR₁₃ wherein R₁₃ is in each case hydrogen or unsubstituted or substituted C₁-C₁₈alkyl or aryl; -NR₁₄R₁₅; -(C₁-C₆alkylene)-NR₁₄R₁₅; -N⁺R₁₄R₁₅R₁₆; -(C₁-C₆alkylene)-N⁺R₁₄R₁₅R₁₆;

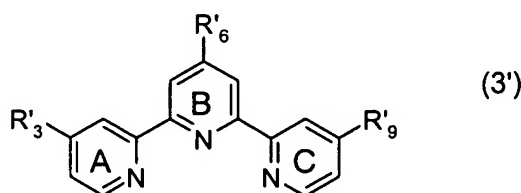
$-N(R_{13})-(C_1-C_6\text{alkylene})-NR_{14}R_{15}$; $-N[(C_1-C_6\text{alkylene})-NR_{14}R_{15}]_2$; $-N(R_{13})-(C_1-C_6\text{alkylene})-N^{\oplus}R_{14}R_{15}R_{16}$; $-N[(C_1-C_6\text{alkylene})-N^{\oplus}R_{14}R_{15}R_{16}]_2$; $-N(R_{13})-N-R_{14}R_{15}$ or $-N(R_{13})-N^{\oplus}R_{14}R_{15}R_{16}$, wherein R_{13} is as defined above and R_{14} , R_{15} and R_{16} are each independently of the other(s) hydrogen or unsubstituted or substituted C_1-C_{18} alkyl or aryl, or R_{14} and R_{15} , together with the nitrogen atom linking them, form an unsubstituted or substituted 5-, 6- or 7-membered ring which may contain further hetero atoms, with the proviso that

at least one of the substituents R_1 to R_{11} is a quaternised nitrogen atom that is not bonded directly to one of the three pyridine rings A, B or C.

16. (currently amended): ~~Use A method~~ according to claim 15, wherein

R_6 is C_{12} alkyl; phenyl unsubstituted or substituted by C_1-C_4 alkyl, C_1-C_4 alkoxy, halogen, cyano, nitro, carboxy, sulfo, hydroxy, amino, N-mono- or N,N-di- C_1-C_4 alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, N-phenylamino, N-naphthylamino, phenyl, phenoxy or by naphthyloxy; cyano; halogen; nitro; $-COOR_{12}$ or $-SO_3R_{12}$ wherein R_{12} is in each case hydrogen, a cation, C_1-C_{12} alkyl, unsubstituted phenyl or phenyl substituted as indicated above; $-SR_{13}$, $-SO_2R_{13}$ or $-OR_{13}$ wherein R_{13} is in each case hydrogen, C_1-C_{12} alkyl, unsubstituted phenyl or phenyl substituted as indicated above; $-NR_{14}R_{15}$; $-(C_1-C_6\text{alkylene})-NR_{14}R_{15}$; $-N^{\oplus}R_{14}R_{15}R_{16}$; $-(C_1-C_6\text{alkylene})-N^{\oplus}R_{14}R_{15}R_{16}$; $-N(R_{13})-(C_1-C_6\text{alkylene})-NR_{14}R_{15}$; $-N(R_{13})-(C_1-C_6\text{alkylene})-N^{\oplus}R_{14}R_{15}R_{16}$; $-N(R_{13})-N-R_{14}R_{15}$ or $-N(R_{13})-N^{\oplus}R_{14}R_{15}R_{16}$, wherein R_{13} may have any one of the above meanings and R_{14} , R_{15} and R_{16} are each independently of the other(s) hydrogen, unsubstituted or hydroxy-substituted C_1-C_{12} alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R_{14} and R_{15} , together with the nitrogen atom linking them, form a pyrrolidine, piperidine, piperazine, morpholine or azepane ring which is unsubstituted or substituted by at least one unsubstituted C_1-C_4 alkyl and/or substituted C_1-C_4 alkyl, wherein the nitrogen atom may be quaternised, and R_1 , R_2 , R_3 , R_4 , R_5 , R_7 , R_8 , R_9 , R_{10} and R_{11} ~~may be~~ are as defined in claim 15 or are hydrogen.

17. (currently amended): ~~Use A method~~ according to ~~either~~ claim 15 ~~or claim 16~~, wherein the ligand L' is a compound of formula (3')

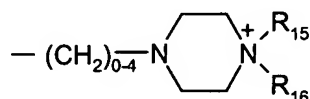


wherein

R'₃, R'₆ and R'₉ have the meanings given for R₆ in claim 15 ~~or claim 16~~, but R'₃ and R'₉ may additionally be hydrogen.

18. (currently amended): ~~Use A method~~ according to claim 17, wherein

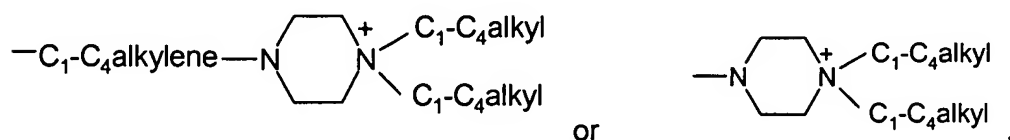
R'₃, R'₆ and R'₉ are each independently of the others phenyl unsubstituted or substituted by C₁-C₄alkyl, C₁-C₄alkoxy, halogen, phenyl or by hydroxy; cyano; nitro; -COOR₁₂ or -SO₃R₁₂ wherein R₁₂ is in each case hydrogen, a cation, C₁-C₄alkyl or phenyl; -SR₁₃, -SO₂R₁₃ or -OR₁₃ wherein R₁₃ is in each case hydrogen, C₁-C₄alkyl or phenyl; -N(CH₃)-NH₂ or -NH-NH₂; amino; N-mono- or N,N-di-C₁-C₄alkylamino unsubstituted or substituted by hydroxy in the alkyl moiety, wherein the nitrogen atoms, ~~especially the nitrogen atoms not bonded to one of the three pyridine rings A, B or C,~~ may be quaternised; N-mono- or N,N-di-C₁-C₄alkyl-N[⊕]R₁₄R₁₅R₁₆ unsubstituted or substituted by hydroxy in the alkyl moiety, wherein R₁₄, R₁₅ and R₁₆ are each independently of the others hydrogen, unsubstituted or hydroxy-substituted C₁-C₁₂alkyl, unsubstituted phenyl or phenyl substituted as indicated above, or R₁₄ and R₁₅, together with the nitrogen atom linking them, form a pyrrolidine, piperidine, piperazine, morpholine or azepane ring which is unsubstituted or substituted by at least one C₁-C₄alkyl or by at least one unsubstituted C₁-C₄alkyl and/or substituted C₁-C₄alkyl, wherein the nitrogen atom may be quaternised; N-mono- or N,N-di-C₁-C₄alkyl-NR₁₄R₁₅ unsubstituted or substituted by hydroxy in the alkyl moiety, wherein R₁₄ and R₁₅ may be as defined above; or a radical



wherein R₁₅ and R₁₆ have the meanings given above, ~~preferably C₁-C₄alkyl~~, and the ring is unsubstituted or substituted, wherein R'₃ and R'₉ likewise may additionally be hydrogen.

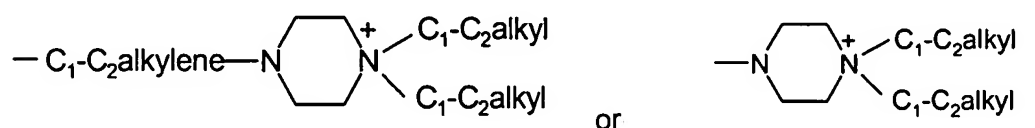
19. (currently amended): ~~Use A method~~ according to ~~either claim 17 or claim 18~~, wherein R₆ is hydroxy.

20. (currently amended): ~~Use A method~~ according to ~~any one of claims 15 to 19~~ claim 15, wherein at least one of the substituents R₁ to R₁₁, ~~preferably one of the substituents R₃, R'₃, R₆, R'₆, R₉ and/or R'₉,~~ is one of the radicals



wherein the unbranched or branched alkylene group may be unsubstituted or substituted and wherein the alkyl groups, which are unbranched or branched independently of one another, may be unsubstituted or each independently of the others substituted and wherein the piperazine ring may be unsubstituted or substituted.

21. (currently amended): ~~Use A method according to any one of claims 15 to 20~~ claim 15 wherein at least one of the substituents ~~R₄ to R₄₄, preferably one of the substituents R₃, R'₃, R₆, R'₆, R₉ and/or R'₉,~~ is one of the radicals



wherein the unbranched or branched alkylene group may be unsubstituted or substituted and wherein the alkyl groups, each independently of the others, may be unsubstituted or substituted and wherein the piperazine ring may be unsubstituted or substituted.

22. (currently amended): ~~Use A method according to any one of claims 1 to 21~~ claim 1 to 21 for the bleaching of stains or of soiling on textile material, or for the prevention of redeposition of migrating dyes in the context of a hydrogen peroxide-free washing process, or for the cleaning of hard surfaces.

23. (currently amended): ~~Use A method according to any one of claims 1 to 21,~~ wherein the metal complex compounds of formula (1) ~~and/or (1')~~ are used as catalysts for reactions using molecular oxygen and/or air for bleaching in the context of paper making.

24. (currently amended): ~~Use A method according to any one of claims 1 to 21,~~ wherein the metal complex compounds of formula (1) ~~and/or (1')~~ are used in selective oxidation reactions in the context of organic synthesis.

25. (currently amended): ~~Use A method according to any one of claims 1 to 21,~~ wherein the metal complex compounds of formula (1) ~~and/or (1')~~ are used in detergent, cleaning, disinfecting or bleaching compositions.

26.(currently amended): ~~Use A method~~ according to claim 25, wherein the metal complex compounds of formula (1) ~~and/or (1')~~ are formed *in situ* in the detergent, cleaning, disinfecting or bleaching composition.

27. (currently amended): A detergent, cleaning, disinfecting or bleaching composition containing

- I) from 0 to 50% by weight A) of at least one anionic surfactant and/or B) one non-ionic surfactant,
- II) from 0 to 70% by weight C) of at least one builder substance,
- III) D) at least one metal complex compound of formula (1) ~~and/or (1')~~ as defined in ~~any one of claims~~ claim 1 to 26 in an amount that, in the liquor, gives a concentration of from 0.5 to 100 mg/litre of liquor, ~~preferably from 1 to 50 mg/litre of liquor~~, when from 0.5 to 20 g/litre of the detergent, cleaning, disinfecting or bleaching composition are added to the liquor, and
- IV) water ad 100% by weight,

wherein the percentages are in each case percentages by weight, based on the total weight of the composition.

28. (currently amended): A solid formulation containing

- a) from 1 to 99% by weight of at least one metal complex compound as defined in ~~any one of claims~~ claim 1 to 21,
- b) from 1 to 99% by weight of at least one binder,
- c) from 0 to 20% by weight of at least one encapsulating material,
- d) from 0 to 20% by weight of at least one further additive and also
- e) from 0 to 20% by weight water.

29. (original): A solid formulation according to claim 28, which is in the form of granules.